



DO I REALLY NEED TO CALL RASO?

Presented By

Matt Slack

Radiological Affairs Support Office (RASO), and

Paul Landin

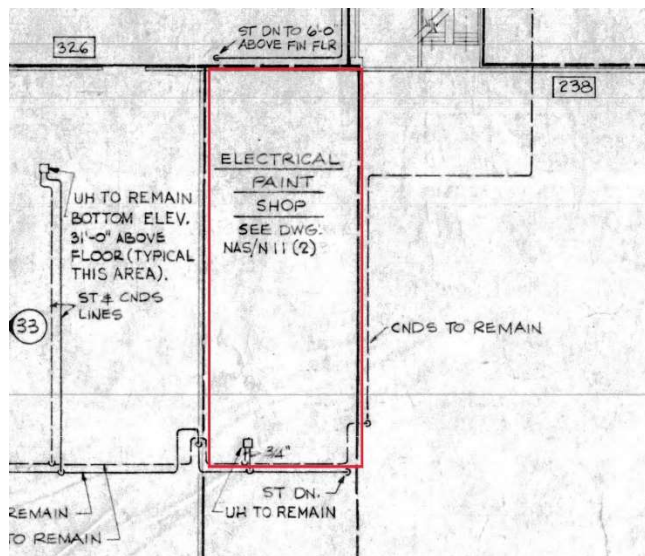
Naval Facilities Engineering Command (NAVFAC) Atlantic

Objective: Describe Roles and Responsibilities of NAVSEADET RASO and NAVFAC for G-RAM



I've found a historic drawing indicating there may have once a radium paint shop in a building with no records of cleanup!

I've come across something that may pose a radiological hazard at my site!



US Navy Photo



- Who's in charge?
- Is there a need for immediate action?

Purpose is to describe what to do, and who to contact for assistance and next steps

Roles and Responsibilities of NAVSEADET RASO and NAVFAC



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO:

5090
Ser N453/10U158072
18 Feb 2010


From: Director, Environmental Readiness Division (N45)
To: Commander, Naval Facilities Engineering Command
Commander, Naval Sea Systems Command

Subj: DON POLICY ON ACTIVITIES INVOLVING GENERAL RADIOACTIVE
MATERIAL (G-RAM) AT ENVIRONMENTAL RESTORATION PROGRAM
SITES

Encl: (1) Department of Navy Policy on Environmental Restoration
Sites Potentially Containing General Radioactive
Material (G-RAM)

1. Enclosure (1) is provided to clarify Navy policy and roles
and responsibilities for general radioactive material (G-RAM)
matters within the Environmental Restoration Program.

2. My point of contact is Wanda L. Holmes who can be reached at
(703) 602-2571, DSN 664-5467 or email: wanda.holmes@navy.mil.


HERMAN A. SHELANSKI
Rear Admiral, U.S. Navy

Copy to:
ODASN (E) (R. Mach)
BRAC PMO
BRAC PMO West
BRAC PMO Northeast
BRAC PMO Southeast
NAVSEASYS COM (04N) (08R)
NAVSEADET RASO
NAVFACENGCOM
NAVFAC ATLANTIC (Code EV)
NAVFAC MIDATLANTIC (Code EV)
NAVFAC MIDWEST (Code EV)

POLICY REFERENCE

- SER N452/10U158072 letter dated 18 Feb 2010 from Director, Environmental Readiness Division (N45) to Commander, Naval Facilities Engineering Command and Commander, Naval Sea Systems Command.
- Subject: *DON Policy in Activities Involving General Radioactive Material (G-RAM) at Environmental Restoration Program Sites*

Note: Protocol for non-ER,N radiological sites is being developed

What is G-RAM?



- Radioactivity present at DON installations may be broadly characterized as Naval Nuclear Propulsion Program (NNPP) radioactive material (N-RAM) or general radioactive material (G-RAM)
 - G-RAM is DON radioactive material that is not used by, controlled by, or associated with the NNPP
- Investigation and clean-up of G-RAM is technically challenging and requires specialized knowledge and expertise
- BRAC PMO and NAVFAC work together to ensure ER cleanup process is implemented at active installations and BRAC sites
 - NAVSEADET RASO provides complete technical, policy assistance, and Naval Radiation Safety Committee oversight for all types of G-RAM
 - ✓ Also responsible for assisting BRAC PMO and NAVFAC in all aspects of CERCLA investigations and cleanups that involve G-RAM are appropriately addressed

G-RAM Policy: Role of NAVSEADET RASO



- At radiologically impacted sites, NAVSEADET RASO shall:
 - Provide technical and policy assistance; assist in the evaluation and selection of appropriate ER response actions
 - Provide technical review of contract scopes of work
 - Participate, upon request, as a technical expert in evaluating contractors for the selection process for G-RAM projects
 - Provide technical input to the RPM for contractor performance reviews
 - Provide technical consultation to the RPM on results of G-RAM field operations (such as laboratory reports, daily reports, and survey results)
 - Perform on-site evaluations of work efforts, and may take confirmatory surveys or samples, but will not participate in field activities
 - Recommend work stoppages as a result of unsafe work practices in the field or unsatisfactory findings during evaluations of work practices
 - Participate in the drafting and technical review process for documents

G-RAM Policy: Role of NAVSEADET RASO



- At G-RAM and radiologically impacted sites, NAVSEADET RASO shall:
 - Review project schedules
 - Review contractor NRC or Agreement State licenses, SOPs, training requirements, and personnel resumes
 - Investigate radiological incidents involving G-RAM in the ER Program
 - Collaborate with and support RPMs to identify potential federal "ARARs" and/or CERCLA risk-based cleanup levels as "release criteria"
 - Collaborate with and support BRAC/NAVFAC to engage with regulatory agencies
 - Collaborate with BRAC/NAVFAC on the HRA review and approval process
 - Review and comment upon the performance of dose and risk assessments
 - Make presentations to officials and the public

G-RAM Policy: Role of BRAC/NAVFAC



- At G-RAM and radiologically impacted sites, BRAC/NAVFAC shall:
 - Ensure that DON personnel authorized to select ER response actions work with NAVSEADET RASO to evaluate and select appropriate response actions
 - Contact NAVSEADET RASO upon the discovery or suspect knowledge of a location that may have G-RAM contamination

 **YES, YOU DO NEED TO CALL RASO!**

- Consult with NAVSEADET RASO for all G-RAM ER investigations, remedial and removal actions, and DON interaction and communication with regulatory agencies
- Ensure that contract SOWs that include G-RAM work efforts or other work performed at radiologically-impacted site are reviewed by NAVSEADET RASO before a RFP is issued.
- Consult with NAVSEADET RASO to resolve any G-RAM issues concerning the contractors' proposals

G-RAM Policy: Role of BRAC/NAVFAC



- At G-RAM and radiologically impacted sites, BRAC/NAVFAC shall:
 - When deemed necessary, request NAVSEADET RASO participation in the contractor selection process for G-RAM projects.
 - Ensure that NAVSEADET RASO input is solicited for technical G-RAM contractor performance reviews.
 - Coordinate with NAVSEADET RASO on contractor G-RAM work stoppages and resolution for resumption of work.
 - Coordinate with NAVSEADET RASO to allow access to on site operations in order to conduct technical compliance oversight.
 - Ensure that NAVSEADET RASO is included in the drafting and technical review for all documents that address G-RAM aspects of the ER Program.
 - Coordinate document reviews with NAVSEADET RASO to ensure time necessary to perform an adequate review is scheduled

G-RAM Policy: Role of BRAC/NAVFAC



- At G-RAM and radiologically impacted sites, BRAC/NAVFAC shall:
 - Maintain and provide project schedules to NAVSEADDET RASO
 - Work with NAVSEADDET RASO to evaluate G-RAM contractor qualifications and ensure appropriate levels of experience and capabilities are available for all selected contractors and subcontractors.
 - Collaborate with NAVSEADDET RASO to identify potential federal ARARs and/or CERCLA risk-based cleanup levels as release criteria for G-RAM hazardous substances.
 - Collaborate with NAVSEADDET RASO when engaging with regulatory agencies on G-RAM issues.
 - Ensure that proper site radiological controls are enforced at work sites based on NAVSEADDET RASO recommendations

Historical Radiological Assessment



HISTORICAL RADIOLOGICAL ASSESSMENT REPORT
History of the Use of General Radioactive Materials
1923 to 2014

NAVAL RESEARCH LABORATORY
WASHINGTON, D.C.

Revision: Final



Prepared for:



Department of the Navy
Naval Sea Systems Command
Detachment
Radiological Affairs Support Office
160 Main Road
Yorktown, VA 23691



Department of the Navy
Naval Facilities Engineering Command Atlantic
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

December 2016

- The DON is preparing a Historical Radiological Assessment (HRA) across naval installations to document where radioactive materials may have been used, stored, or disposed
- Previous investigations have found a correlation between historic activities known to generate G-RAM and certain types of DON installations such as shipyards and air stations; particularly installations that had radium dial painting facilities.
- The most common type of G-RAM contamination resulted from the use, handling, refurbishment, and disposal of radioluminescent devices (time pieces, compasses dials, gauges, and personnel and deck markers) referred to as “commodities”
 - Radium-226 (time pieces, dials, gauges)
 - Strontium-90 (personnel and deck markers)

Historical Radiological Assessment



- The radioluminescent devices were used by DON personnel, equipment, aircraft, ships, vehicles, and at both Navy and Marine Corps installations.
 - Most of the radioluminescent devices used in the 1940s through 1960s contained radium (Ra-226) paint.
 - Starting in the early 1950s, other radioactive elements (Strontium-90, Tritium [H-3]) were used in radioluminescent devices.
 - Most radioluminescent devices were phased out starting in the early 1970s.

Just because an HRA has not been completed or there are known plans for one to be, it does not mean that G-RAM can not be discovered at any facility or site!

Example Radiological Commodities



Radioluminescent Gauge (ca. 1950s, 1960s)



Radioluminescent Deck Markers front & back
(ca. 2015 & Navy Archives)



Photographs from Oak Ridge Associated University Museum
<https://www.ornl.gov/PTP/collection/radioluminescent/radioluminescent.htm>

Note the gauge is marked with a radiological symbol and the deck marker is engraved with:

“RADIOACTIVE POISON INSIDE DISPOSE OF BY BURIAL”

G-RAM: What's a commodity?



Examples

- Smoke detectors
- Self-luminous exit signs
- Night-vision equipment
- Spark gap irradiators
- Ignition exciters
- Thorium-fluoride coated lenses
- Thoriated-tungsten welding rods
- Mag-thor engine components
- Oxygen system components
- In-flight Blade Inspection Systems (IBIS)
- Aircraft ice detector probes
- Radar electronics
- Electron tubes

US Navy Photographs



Rusted clump of Ra-226



Alidade (Ra-226) found out a metal recycler



Ra-226 rope – triggered portal monitor at disposal facility



Electron tube (Ra-226) found at IR site

Example Activities Where G-RAM May Be Encountered



US Navy Photograph of helicopter transmission case (Th-232)

Naval Air Stations/Aircraft Maintenance

- Paint shops: luminescent painting of dials/gauges/etc
- Parachute shops: personnel markers
- Engine components: Mag-thor
- Welding: welding rods containing thorium
- Counterweights: depleted uranium
- Ground control approach radar units

Navy Vessels/On-Shore Maintenance

- Deck markers
- Pathway/hatch markers
- Ballast/counterweights using depleted uranium

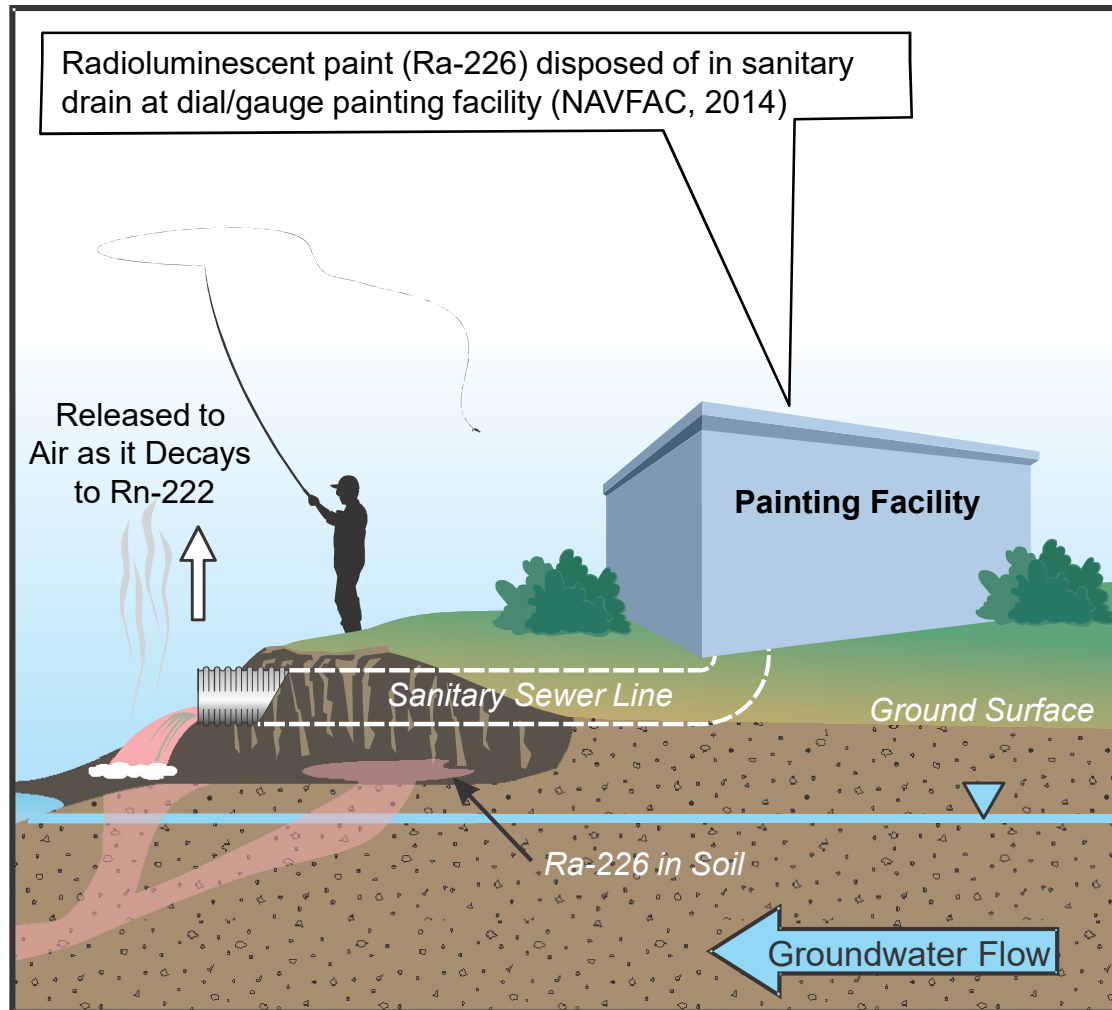
Research and Development

- Radiography and nondestructive examination
- Radiochemistry
- Radiation detection instrumentation
- Hypervelocity projectiles
- Radiometallurgy
- Particle accelerators
- Nuclear reactors

Disposal

- Landfilling/burial of commodities
- Pouring of radioactive liquids into drains/sewers/pits
- Radioactive storage areas pending disposal
- DRMO

G-RAM: Basic Conceptual Site Model



Understanding the CSM is critical to planning a radiological investigation

History/Use -
Radiation source?

Which radionuclide(s)
and what type of
radiation emitted?

Fixed contamination?
Removable contamination?

Release mechanism(s)?

What media are impacted?

Transport pathways?

Exposure routes?

Case Study: Cheatham Annex (VA) Site 9



- **No HRA for this installation**
- **Radiological contamination suspected at Site 9 by RPM while reviewing Initial Assessment Study –**
 - “Low level radiological items were handled by DPDO (DRMO) and disposed or sold as scrap metal.”*
- **RPM Contacted NAVFAC LANT**
 - As directed by NAVFAC supervisor / manager
 - Next steps and contact information provided for RASO
- **RPM Contacted RASO**
 - Provided site history
 - Shared information that indicated radiological should be investigated
 - Requested meeting with RASO (including contractor with contractor that has radiological expertise)

Case Study: Cheatham Annex (VA) Site 9



- **RASO agreed with the RPM's assessment**
 - Historical use and disposal of G-RAM indicated a reason for concern
 - G-RAM formerly stored/used adjacent to Site 9 at former DRMO
 - Consistent with RASO's experience at other DRMOs
- **DRMO crushed and stored material prior to disposal (potential LLRW)**

- Used for storage of equipment and materials
- 1/3 site vegetation and debris; 2/3 asphalt
- Total ~4.5 acres (750 x 250 ft)



Case Study: Cheatham Annex (VA) Site 9



- **Site 9 – Planning/Field Work**
- **Contractor SOW developed with RASO**
- **Work Plan and SAP developed and approved by LANT/RASO**
- **Surface scan conducted September 2017**
 - Gamma scanning survey equipment sensitive enough to capture surface and subsurface levels during Phase 1
 - Final gamma survey was conducted on the hard surface
 - Additional gamma scan survey will be conducted for Phase 2
- **G-RAM removed, stored on site for disposal**
- **Confirmation samples taken**

Ra-226 Marker



US Navy Photo

US Navy Photo



Th-232 Glass

Case Study: Cheatham Annex (VA) Site 9



- **Minimal available historic site documentation led to potential for and discovery of G-RAM**
- **Engage with RASO early in process to avoid delays**
 - Communicate with RASO and request an EPM assignment upfront
 - Emphasize your schedule and schedule drivers
 - Request reasonable turn around time from RASO in order to establish a realistic schedule
- **Involve your management and keep them informed**
- **Reach out for tips/templates**
 - Radiological Workgroup members
 - NAVFAC LANT
 - Other RPMs
- **Always cc: RASO on correspondence with Army for LLRW disposal**
 - A waiver process exists to have contractor disposal – work with RASO



Am-241 Smoke Detector

US Navy Photo

Knowledge Check



- **G-RAM is DON radioactive material that is not used by, controlled by, or associated with the Naval Nuclear Propulsion Program (NNPP)**
 - True or False?

- **There is no policy defining roles and responsibilities for activities involving G-RAM at Environmental Restoration Program sites.**
 - True or False?

- **If a HRA has not been completed or there are no known plans for one to be, it means that G-RAM can not be discovered at a facility or site.**
 - True or False?

Key Take Away Messages

- There is a policy that establishes roles and responsibilities for RASO/NAVFAC/BRAC at ER,N G-RAM sites
- G-RAM is DON radioactive material that is not used by, controlled by, or associated with the NNPP
- The investigation and clean-up of G-RAM is technically challenging and requires specialized knowledge and expertise
- The DON is preparing a Historical Radiological Assessment (HRA) across naval installations where radioactive materials may have been used, stored, or disposed to document the historical use of G-RAM operations or applications
- If you need help with G-RAM or suspect that G-RAM may be present..... **YES, YOU DO NEED TO CALL RASO!**

Contacts and Questions



Points of Contact

RADIOLOGICAL AFFAIRS SUPPORT OFFICE: Matt Slack

– matthew.slack@navy.mil

NAVFAC ATLANTIC: Paul Landin

– paul.landin@navy.mil

Questions ?